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Pill-Popping Pets

By JAMES VLAHOS

Corrections Appended

Max retrieves Frisbees. He gobbles jelly beans. He chases deer. He is — and this should be remembered when discussions of cases like his blunder into the thickets of cognitive ethology, normative [psychology](#) and intraspecies solipsism — a good dog. A 3-year-old German shepherd, all rangy limbs and skittering paws, he patrols the hardwood floors and wall-to-wall carpets of a cul-de-sac home in Lafayette, Calif., living with Michelle Spring, a nurse, and her husband, Allan, a retired airline pilot. Max fields tennis balls with his dexterous forelegs and can stand on his hindquarters to open the front door. He loves car rides and will leap inside any available auto, even ones belonging to strangers. Housebroken, he did slip up once indoors, but everybody knows that the Turducken Incident simply wasn't his fault. "He's agile," Allan says. "He's healthy. He's a good-looking animal." Michelle adds, "We love him to death." That is why they had no choice, she says. The dog simply had to go on psychoactive drugs.

I arrived the night Max was to receive his first pill. He picked at the food in his chow bowl while the Springs sat at the kitchen table discussing his problems. For starters, there was his overpowering need to be near people, especially Allan. If they put Max outside, he quickly relieved himself and then rushed back indoors; he raced into rooms that Allan was about to occupy; he rested his head against the bathroom door during his master's ablutions. "Watch this," Allan said. He and Michelle stood up to hug. The moment they touched, Max unleashed a string of high-pitched barks. "He likes being close to us, but he doesn't like us being close to each other," Allan said.

These behaviors, however, weren't what prompted the psychiatric intervention. The Springs led me downstairs to the family room — Max, supper unfinished, bounded ahead. Downstairs, Allan pointed to Max, who was lying on the floor and staring at his tail. He looked angry at it, *disturbed* by it. "You can see the pressure building in his psyche until he's ready to explode," Michelle said. And then he did: Max jumped to his feet and lunged. His jaws snapped, catching only air, and he spun counterclockwise in place, an accelerating blur of fur and teeth and frustration. Tail-chasing is normal — except that Max did it daily, often for hours on end. "He's like a junkie needing a fix," Allan said. "At times he can't not do it. He goes berserk."

Allan went upstairs and returned moments later with a bit of ground turkey and a pill. He hid the pill in the meat and extended his hand to Max, who had stopped spinning. The medicine was chemically identical to clomipramine, a tricyclic antidepressant used in human psychiatric care, but it came in a green-and-white [Novartis](#) box brightened by the picture of a happy yellow lab. This wasn't Anafranil, the brand name for the human version of the drug; it was Clomicalm, just for dogs. Approved by the [Food and Drug Administration](#) for treating [separation anxiety](#), a problem that can occur when dogs are left home alone, the medication is also commonly prescribed off-label for patients with Max's diagnosis: compulsive disorder. He was the canine version of a person who washes his hands 20 times an hour. Max leaned forward and gulped the pill down.

The practice of prescribing medications designed for humans to animals has grown substantially over the past decade and a half, and pharmaceutical companies have recently begun experimenting with a more direct strategy: marketing behavior-modification and "lifestyle" drugs specifically for pets. America's animals, it seems, have very American health problems. More than

20 percent of our dogs are overweight; [Pfizer](#)'s Slentrol was approved by the F.D.A. last year as the country's first canine anti-[obesity](#) medication. Dogs live 13 years on average, considerably longer than they did in the past; Pfizer's Anipryl treats cognitive dysfunction so that absent-minded pets can remember the location of the supper bowl or doggy door. For lonely dogs with separation anxiety, [Eli Lilly](#) brought to market its own drug Reconcile last year. The only difference between it and [Prozac](#) is that Reconcile is chewable and tastes like beef.

Doggy [diet](#) pills may be plainly absurd, but scientists in an expanding field known as behavioral pharmacology say that the combination of new drug therapies and progressive training techniques can solve problems that in the past almost always resulted in euthanasia. The supposed effectiveness of psychiatric medicines in treating mood and behavior issues is prompting new questions in the centuries-old debate over what, exactly, separates mankind from the beasts. If the strict Cartesian view were true — that animals are essentially flesh-and-blood automatons, lacking anything resembling human emotion, memory and consciousness — then why do animals develop mental illnesses that eerily resemble human ones and that respond to the same medications? What can behavioral pharmacology teach us about animal minds and, ultimately, our own?

ON SEPT. 5, 1379, A TRIO OF French pigs, agitated by the squealing of a piglet, bowled over their keeper's son, who died shortly thereafter of the injuries. As E. P. Evans recounts in his 1906 monograph, "The Criminal Prosecution and Capital [Punishment](#) of Animals," "the three sows, after due process of law, were condemned to death" along with several other pigs who had "hastened to the scene of the murder and by their cries and aggressive actions showed that they approved of the assault." (The accomplices were later

pardoned.) Fast-forward to December 2007 to witness a curious animal proceeding of the modern era: Mitzi-Bitzi, a lap dog, modeling a \$118,000 diamond bracelet at the opening of Chateau Poochie, a pet hotel and spa near Miami. “She’s just so *special*,” her owner, Marilyn Belkin, told me later, as if that explained things. The sows and Mitzi got opposite treatment, but the beliefs of Belkin and the pig prosecutors weren’t so different. In medieval times and in the present, we often act as if animals had thoughts, feelings and desires that resemble those of people. How else could you justify the porcine death penalty; why splurge on a blueberry facial when a simple roll on the lawn would do?

Marketers have a new name for the age-old tendency to view animals as furry versions of ourselves: “humanization,” a trend that is fueling the explosive growth of the pet industry and the rise of modern pet pharma. Americans forked over \$49 billion for pet products and services last year, up \$11.5 billion from 2003; other than consumer electronics, pet products are the fastest-growing retail segment. The market expansion is being driven both by more pets and by more spending per pet, especially by affluent baby boomers whose children have graduated from college. A third of the total spending, and the fastest-growing category, is health care, with treatments formerly reserved for people — root canals, [chemotherapy](#), [liposuction](#), mood pills — being administered to pets. “I get asked all the time, ‘What is it with this humanization — do we suddenly love our pets a whole lot more?’ ” says David Lummis, who analyzes the pet industry for the market research firm Packaged Facts. “My theory is that it’s always been there, but it’s been sanctioned now. It’s not just the crazy cat lady. It’s marketers and all of this consumer advertising that have made it O.K. to spend tons of money on your pet.”

Humanization has pharmaceutical companies salivating like Pavlov's dogs. Surveys by the American Pet Products Manufacturers Association found that 77 percent of dog owners and 52 percent of cat owners gave their animals some sort of medication in 2006, both up at least 25 percentage points from 2004. Sales of drugs for pets recently surpassed those for farm animals. Eli Lilly created its "companion animal" division at the beginning of 2007 and over the next three years hopes to release several other drugs. Pfizer, whose companion animal revenues have grown 57 percent since 2003 to nearly \$1 billion, hopes to develop [medications for pain](#), [cancer](#) and behavioral issues. Most consumer spending is still on traditional pet medications like antiparasitics, but Ipsos, a marketing research firm, estimates that at least \$15 million was spent on behavior-modification drugs in the United States in 2005. "As people are seeing more complex and sophisticated drugs for themselves, they want that same quality for their pets," Dr. Melanie Berson, a veterinarian at the F.D.A.'s Center for Veterinary Medicine, has said. People's willingness to employ behavior-modifying medications stems in part from a growing desire for more convenient, obedient household animals. "Our expectations are really going up," Lummis says. "Owners want their pets to be more like little well-behaved children."

Potent as a marketing trend, humanization has long been scorned as scientific practice by researchers working in the behaviorist tradition of B. F. Skinner. In "Inside the Animal Mind," George Page summarizes the reasons: "Since we cannot get inside the animal's mind . . . and since the animal cannot report what's going on — not in a 'language' we can readily understand — all we have left are guesses and speculation fatally tainted by anthropomorphism." Strict behaviorists focus instead on observable stimulus-response conditioning: for example, a puppy learning to sit to receive a treat. Actions that cannot be explained this way are usually attributed to blind instinct. As such, hard-core

Skinnerian philosophy amounts to a perversion of *cogito ergo sum*: I can't prove that animals think, therefore they don't. In dealing with problem pets, veterinarians with a behaviorist bent don't concern themselves so much with what might be happening inside the brain of the animal or try to correct neurochemical imbalances with drugs. Instead, a compulsive or anxious animal is seen as one that just needs to be better-trained.

The debate about animal minds is at least as old as Aristotle, who posited that men alone possess reason. The 17th-century French philosopher Nicolas Malebranche wrote that animals "desire nothing, fear nothing, know nothing," while Voltaire asked, "Answer me, mechanist, has Nature arranged all the springs of feeling in this animal to the end that he might not feel?" Darwin's view was, Of course not. In "The Descent of Man" he wrote, "We have seen that the senses and intuitions, the various emotions and faculties . . . of which man boasts, may be found in an incipient, or even sometimes in a well-developed condition, in the lower animals." The staggering assertion of Darwin's theory is that evolutionary continuity applies not just to bodies but to brains. "The difference in mind between man and the higher animals, great as it is, certainly is one of degree and not of kind," he wrote.

For much of the 20th century scientists willfully dismissed this line of thinking, which has been rekindled only in the past three decades with the rise of a field known as cognitive ethology. The guiding belief is that while it is scientifically baseless to assume that animals think and feel just as we do, it is equally foolhardy to assume that they don't think and feel at all. In laboratory experiments and field observations, practitioners have presented evidence of analogical reasoning by apes, counting by rats and the capacity of pigeons to distinguish the paintings of Picasso from those of Monet. Researchers have demonstrated that animals can grasp basic abstractions like "same" and

“different” and use mental flexibility to solve novel problems in the laboratory for which hard-wired instinct couldn’t have prepared them. It is impressive but perhaps unsurprising that a parrot was taught to categorize colors or that dolphins learned the syntactic distinction between “take the surfboard to the Frisbee” and “take the Frisbee to the surfboard” — we already tend to think of these animals as being smart. More eye-opening are glimmers of cognition from way down the phylogenetic chain. Research has shown that bumblebees can remember which flowers they have already visited and that two-inch-long cockroaches from Madagascar can tell the difference between a familiar person and a stranger. (If the bug hisses loudly at you, it’s time to introduce yourself.)

Cognitive ethologists have had more difficulty gathering evidence for animal emotion. To any pet owner who has stroked a purring cat or watched a dog cavort when his chow hits the bowl, it seems intuitively obvious that animals experience feelings. But intuition isn’t hard science — it’s just more humanization. Enter behavioral pharmacology, which has provided a tantalizing new window into the animal mind. Dr. Nicholas Dodman, who pioneered the field and founded the [Tufts University](#) Animal Behavior Clinic, says that skeptics of the premise that animals have emotional states used to ask him how he could say that a pacing, hyperventilating dog was actually feeling anxious. “Well, how about this?” Dodman would reply. “We’ll give him an antianxiety drug and see what happens.”

THE GROUNDS OF THE CUMMINGS School of Veterinary Medicine at Tufts sprawl over 640 acres of rolling greenery in central Massachusetts. When I arrived to visit in March, one of the first things Dodman told me was that the campus used to be the site of a state mental hospital. Like other facilities, it had been shuttered in the 1960s following the revolutionary

discovery of drugs that treated [schizophrenia](#) and other disorders so effectively that many patients no longer required institutionalization. “Ironically, this paved the way for our school, our behavior program, and novel pharmacological treatments for animal behavior problems,” Dodman said. Or, as he later said, “we traded one group of inmates for another.”

Dodman, an Englishman, began his career in the early 1970s as a roving country vet in the tradition of James Herriot; he went on to write a popular series of advice books for pet owners, the latest of which is “The Well-Adjusted Dog.” In 1981 he moved to the United States to become a professor of [anesthesia](#) at Cummings. Drugs interested him greatly but comatose patients, increasingly, did not, and he began to wonder: Could medications transform veterinary behavioral medicine just as radically as they had human psychiatric care? He says he quickly realized that the field was “completely wide open, like virgin snow.” At a veterinary conference in the late 1980s, he presented his vision of the psychoactive frontier and “saw jaws drop around the room. It was like, ‘Who is this strange masked man?’ ” Three decades later, “it’s almost mainstream for behaviorists to know something about pharmacology,” Dodman says.

Inside his small office, Dodman, wearing a tie-and-tasseled-loafer ensemble topped by a white lab coat, received the day’s first patient. A muzzled dog on a short lead towed Joe and Mahala Richards, from Mendon, Mass., into the room. “So here we have Zoey, who’s a yellow black-mouthed cur, 5 years old, and you got her at 7 months,” Dodman said. “I’m already picking up that she’s fearful and anxious, and that usually stems from a disturbed childhood.”

“We know she was abused,” Mahala said.

“There you go,” Dodman replied.

Joe said Zoey's problem was that she sometimes attacked when food was around. The worst incident had happened a week ago when Mahala was watching television and reached for a piece of cheese. "She just came after me," Mahala said. Joe added, "Zoey had her on the couch — she's screaming at the top of her lungs— and Zoey just kept going at her hands." Mahala held up a scarred wrist. "My God, that's nasty," Dodman said. He listened for 20 minutes and then issued a diagnosis: something called "conflict aggression," which meant that occasionally Zoey forgot that she didn't need to fight to get her share of food. Zoey was to be kept from hot dogs, peanut-butter bones and any other culinary provocations. High places like beds were forbidden (elevated positions can make dogs feel more confident), and exercise was essential. Outlining what he called the "nothing in life is free" program, Dodman said that Zoey should be made to sit before feeding and that affection was to be rationed. The overall goal was to get Zoey to respect the leadership of her owners, which would raise her inhibition to attack. These behavior modifications alone might be enough to cure Zoey, Dodman concluded.

"We don't want to have to put her down," Mahala replied quietly.

"No," Dodman said. "A serious bite is a risk factor for euthanasia for the dog, which is why another component of the program might be some medicine. If we were to ask Zoey: 'Look, if you slip up in the future, and you bite someone like that again, the chances are you're not going to come out of it alive. But we can make you feel better if we give you some medicine like, for example, Prozac. Would you like to have the medicine that might save your life?' And she might go, '*Grrr-rrr rrrup* — yeah, yeah, I'll take the medicine.' It's a lifesaving thing." Joe and Mahala left a half-hour later with a scrip in hand.

Aggression is the leading issue that brings animals into clinics; it and other behavior problems are the top reasons that pets are surrendered to shelters. Half of them are euthanized, roughly three to four million animals per year, and an equal number are believed to be put down in private practices. Treatment with psychoactive medications is then a very real alternative to lethal injection. Prozac, a selective serotonin reuptake inhibitor (S.S.R.I.), prolongs the effects of that neurotransmitter to reduce impulsivity, stabilize moods and lower [anxiety](#), Dodman says. He is friends with the noted [Harvard](#) psychiatrist John Ratey, and they once compared the drugs they employ to treat violent people and animals. “You superimpose my portfolio on top of his, and it’s the same thing,” Dodman says. He has patented his S.S.R.I. approach and is working with a pharmaceutical company, Accura Animal Health, that plans to bring it to market as the first F.D.A.-approved treatment for canine aggression. (The current use of Prozac and similar drugs is prescribed off-label.)

Aggression is a feline problem too. A few weeks after visiting Dodman, I went to the home of a man in West Los Angeles whose pet was on Prozac. The owner, Doug, asked me not to use his last name because he didn’t want business associates to know about what he called his “cougar psycho little miniature stalker” — Booboo the cat.

The first incident took place four years ago after Booboo ate some decorative dried flowers. Booboo scaled his cat tree and sat there with his eyes “a little dilated and cross-eyed,” Doug said. He started “growling like a banshee,” released “a high, shrill wail” and lunged. “He ripped my leg up and wouldn’t let go.” Doug fled, and Booboo pursued. Finally he was able to trap the cat in a bedroom. From then on Booboo was different. He would periodically ambush Doug. Over time, Doug noticed that attacks were more likely if he smelled at

all abnormal — for instance, if he had been near a woman wearing perfume — so he would take a shower after coming home and then change into his designated cat-wrangling outfit.

Doug consulted a behaviorist, Dr. Karen Sueda. One hypothesis was that Booboo suffered from a feline version of schizophrenia — there is evidence that animals experience auditory and visual [hallucinations](#) and can temporarily enter deluded states in which they attack. Sueda didn't think that was likely with Booboo, nor did she think his attacks were motivated by fear, as is often the case with animal aggression. In Booboo she says she saw a dominant, confident cat who “wanted to control his personal territory.” One theory about such animals is that they suffer from a neurochemical imbalance. As Dodman explained in his book “The Cat Who Cried for Help,” “By engaging in and winning aggressive encounters, dominant animals drive up serotonin levels and gain in composure.” Sueda prescribed Prozac to boost the effects of the neurotransmitter.

Doug led me up the stairs in his house to the second floor. He donned a pair of khakis that he had lined with heavy-gauge ballistic nylon and washed up because he had shaken hands with me. He crept toward the master bedroom, where Booboo was permanently quarantined behind a door that had been remounted to swing outward to facilitate quick escapes by Doug. “Just behind this door lurks the Tasmanian devil,” Doug said before slipping inside. I squatted at ground level and watched through a transparent doggy door. The 400-square-foot room had a walk-in closet, a four-poster bed and a floor-to-ceiling view of Beverly Hills mansions dotting a scenic canyon. The suite belonged entirely to Booboo, though Doug said he was now able to sleep over a few nights a week. Booboo slinked past the window and gave me a steady gaze. He had a tuxedo coat, mostly black but with patches of white on his feet,

underbelly and forehead. Doug scooped him up and they nuzzled face to face. “He’s just warm, soft and fuzzy, and he purrs, and he’s cuddly,” he murmured.

Separation anxiety, bane of modern home-alone dogs and target of Lilly’s new Reconcile, is a problem millennia in the making. Archaeologists and geneticists estimate that the domestication of wolves (*Canis [lupus](#)*) into dogs (*Canis lupus familiaris*) began at least 15,000 years ago. One hypothesis about how this happened is that as humans settled down and established villages, piles of discarded food scraps and plant matter accumulated on the outskirts. Wolves that were genetically predisposed to be slightly less fearful of humans would feed off the free bounty, while the more skittish animals would steer clear. “At this point, natural selection would take over,” Jake Page explains in “Dogs: A Natural History.” “As the dump-loving wolves reproduced with each other, their tameness would probably become more and more pronounced.” The gentler animals were increasingly favored and brought into our lives to the point that many dogs (42 percent, according to a survey by the American Pet Products Manufacturers Association) now sleep in the same beds as their owners. Extreme attachment to people is one of the defining traits of dogs.

Extreme attachment, unfortunately, also causes some dogs extreme suffering when deprived of their owners’ company. Martha and Phil Bridges live in Sacramento with a 2-year-old lab mix named Rocco. The Bridges told me that when they left home and went to work each day from 8 a.m to 5 p.m., they would lock Rocco in a large cage in the dining room to keep the young dog from running amok. One day last fall they returned to find the dog loose with his nose bloodied from prying the cage door open. They locked him in it again. The next evening Rocco was still inside but had shredded his pillow bed and reared up so violently that the cage was destroyed. Next the Bridges used a baby gate to block off part of the house so that Rocco would have more room

to roam. He stripped five feet of carpeting from the floor. They locked him in the bathroom. Shower curtain shredded, shampoo swallowed, door frame torn. Realizing they needed help, the Bridges took Rocco to see Dr. Rachel Malamed, a resident at the Behavior Service at the School of Veterinary Medicine at the University of California, Davis. She diagnosed separation anxiety, outlined a retraining program and wrote a scrip. The happy outcome: Rocco “has never had another problem since we put him on Reconcile,” Martha says.

An estimated 14 percent or more of American dogs have separation anxiety. The problem signs include home and self-destruction; prolonged whining, barking or [drooling](#); or simply standing by the front door all day in a lonely, panting vigil. (“Nannycam”-type video recorders have captured all of the above.) The terms for Reconcile’s F.D.A. approval were that the drug had to be prescribed with a course of behavior modification. In Rocco’s case, Malamed taught the Bridges to stage mock departures — jingling the car keys, opening the front door — while giving treats so that Rocco would associate their leaving with a yummy reward. When the Bridges left the house for real, they were to slip out with zero fuss; frantic barking and jumping were to be ignored. “We brought on this anxiety with him being so attached to us,” Martha says. “Now we have to break that bond — without breaking it to the point where he won’t know that we still love him.”

When it comes to retraining, however, some people are slackers. Dodman estimates that 25 percent of the pet owners he sees don’t take his advice. At U.C. Davis I observed one couple impatiently shrugging off Malamed’s directives. I was watching the appointment via closed-circuit television with another vet, Dr. Jeannine Berger, and she sighed in exasperation. “They just want the magic pill,” she said. “People always want the magic pill.” The studies

of Reconcile show why behavioral pharmacologists prefer not to rely on the medicine bottle — or for that matter, retraining — alone. Dr. Steve Connell, a veterinarian at Eli Lilly, told me that “behavior modification by itself works. There’s not any question about that. But if you use behavior modification in conjunction with Reconcile, it works quicker and it works better.”

How do researchers know that? The patients, after all, can’t describe the subtleties of their moods to therapists. Efficacy studies instead rely upon people to record signs of animal distress, like barks per hour and household objects destroyed. The study Lilly submitted to the F.D.A. in support of Reconcile involved 242 dogs scattered around the United States and Canada; in the double-blind trial, neither the veterinarians nor the owners involved knew which dogs were receiving Reconcile and which ones got a placebo. All dogs received behavior retraining. The results were strong enough to demonstrate efficacy but hardly earthshaking: 72 percent of the dogs on Reconcile showed improvement after eight weeks of treatment, while 50 percent of those receiving the placebo did. The study also found that more than half of the dogs on the drug experienced short-term side effects, including [lethargy](#), [depression](#) and [loss of appetite](#).

One thought had haunted me as I listened to the Bridges’ story: If I were locked inside the bathroom all day, I’d swallow the shampoo, too. Although most animal-behavior problems are believed to have genetic roots, their expressions are typically triggered by the unnatural lives that people force their pets to lead. “A dog that lived on a farm and ran around chasing rabbits all day would be more prone to being stable than a dog living in an apartment in Manhattan,” Dodman says. Undomesticated canids, neither confined nor excessively attached to people, don’t suffer from separation anxiety. Some captive horses endlessly circle their stalls or corrals — a compulsive behavior

similar to Max's tail chasing — but such purposeless repetitions have never been observed in the wild.

Pharmacological treatments, furthermore, are sometimes more for the convenience of owners than they are for the health of pets. When the dog bites, when the cat pees — “a lot of the ‘behavior problems’ we see are actually normal behaviors for the animal,” Dodman says. Cats aren't mentally ill if they attack a new feline in the household or claw furniture to mark their domain. Food guarding and aggression toward strangers boost a dog's survival rate in the wild but don't cut it in the living room. And both cats and dogs demarcate territory with urine. “If a dog goes to the bathroom on a bush outside, you don't mind as long as it's not your bush,” Dodman says. “But when he comes back to the house and lifts his leg on your chair, it's like, ‘Is the dog mentally sick?’ ”

In many other situations, however, a medicated animal may be a better-off one — for his own sake and not just for his master's peace of mind. Obsessive dogs like Max sometimes injure themselves by spinning right into furniture or chewing their legs or tails until they're bloody. You could also argue that Max would be happier not spinning and chasing squirrels instead — an anthropomorphic judgment, perhaps, but one that is hard to dispute after seeing the panting, possessed animal on the whirl. Medicating dogs like Rocco, meanwhile, makes some people queasy because separation anxiety is so clearly related to the absentee lifestyles of owners. Dr. Jean Donaldson, director of the San Francisco S.P.C.A. Academy for Dog Trainers, told me that she has always insisted that people who don't have enough free time shouldn't own dogs. But she recognizes that many ill-equipped people will do so anyway and supports employing drugs. In her view, our complicity in the problem's creation doesn't absolve us of responsibility for finding solutions, even ones

with mild side effects. “Can you imagine having separation anxiety?” she asked. “We’re talking ‘Silence of the Lambs’ here, being in the pit so that you rip off your own fingernails and break your teeth because of the degree of [panic attacks](#) you’re having. Do we really think that the problem here is a dry mouth from Reconcile?”

NOT EVERYBODY AGREES that America’s pets are facing a major mental-health crisis — or that whatever their problems, that drugs are necessarily part of the solution. One of the most passionate voices in the just-say-no camp belongs to Dr. Ian Dunbar, a veterinarian who has his doctorate in animal behavior and is the founder of a highly regarded instructional empire called Sirius Dog Training. “I have never in my life had to resort to using drugs to resolve a behavior problem,” he says. The rush to the medicine bottle for easily resolved problems like canine obesity — “Just feed the dog less!” — shows a disturbing parallel to the human approach to health care, he says. “We lead an unhealthy lifestyle and then rely on drugs to correct it.”

Dunbar lives down a winding lane high in the Berkeley Hills. When I arrived to visit, he led me into the living room, where we were joined by his three bounding dogs, Claude, Hugo and Dune. Claude had been a troubled S.P.C.A. shelter dog. He bit, was often anxious and had a problem known as [pica](#), meaning he compulsively devoured nonfood items. When Dunbar rescued him a few years ago, Claude was recovering from an operation to remove a basketball from his intestines. “He would have been the ideal candidate for a drug treatment, but to me that was unnecessary if you know some of the simplest things about dog training,” Dunbar said.

Pharmacological aids are helpful in extreme circumstances, Dunbar acknowledged, but for the vast majority of cases, behavior modification alone

does the trick. For problem dogs like Claude, he employs the simple, unswerving strategy of a trainer: Ignore unwanted behaviors and reward desired ones. The magic pill in Dunbar's arsenal is a rubber chew toy stuffed with food. As I took a seat on the couch, he tossed three of them on the floor. The dogs ignored me completely — there was none of the usual canine pouncing on the visitor — and set to work. Absorbed, they gnawed and shook the toys, which slowly released kibble. It would take 45 minutes before the supply was exhausted. Claude, his attention refocused with the help of chew toys, no longer bit people or gobbled indigestibles. He was calm and the best-behaved of the household's three canines. "The dog is creating endorphins of his own, his own natural drug therapy, while enjoying a totally acceptable activity," Dunbar said.

To critics like Dunbar, separation anxiety is the attention-deficit disorder of the pet world, a problem that is overzealously pathologized, carelessly diagnosed and liberally medicated. His critique is unabashedly Skinnerian: "We're confusing behavior problems, which are observable and quantifiable, with terms like 'anxiety,' which describe the dog's internal mental state, for which we have absolutely zero proof," he says. On a personal level, Dunbar suspects that animals do have thoughts and feelings and can become genuinely anxious when their owners are gone. But he is careful to not let assumptions cloud his professional judgment, because not every situation that looks like separation anxiety is in fact that condition. Lilly's Web site for Reconcile states that "separation anxiety is a clinical condition in your dog's brain." Dunbar offers possible alternate explanations: Some dogs that are physically punished have inadvertently learned that they can get away with whatever they want when the humans are gone. Others are just bored and having fun. "What do we expect dogs to do when we go to work — watch the telly, do the crosswords or read the paper?" he asks. Hiding stuffed chew toys

around the house is a good way to keep dogs occupied. “In the wild, the dog’s major activity is looking for food,” he says. “What most owners do is they feed the dog in the bowl, and within two minutes you’ve stolen his *raison d’être*. So now the dog is looking for activity, which we label ‘trouble’ and diagnose as all sorts of things like compulsion and separation anxiety.”

Dunbar is working with a pet-products manufacturer on an electronic dog-sitter that combines the reward elements of a classic Skinner box with the unblinking surveillance of Bentham’s Panopticon. Employing a network of sensors, the device monitors when the dog barks, how many steps it takes during the day, how long it lies down in its bed and when it plays with chew toys. Acting as a sort of robo-Dunbar, the gizmo automatically dispenses small treats when the animal is calm and well behaved. “Rather than the very general deadening of an anxiolytic or tranquilizing drug, what I want is a very specific education effect to teach the dog how he should act,” Dunbar says.

Modern owners are increasingly trying to “sterilize” pet ownership, he adds, trying to pharmacologically control dogs so that they don’t act like dogs. “What people want is a pet that is on par with a [TiVo](#), that its activity, play and affection are on demand,” he says “Then, when they’re done, they want to turn it off.”

Back in the living room, we watched Claude and his housemates work at the chew toys. “Training is basically about forming a relationship, but for some people, that interactive process is now giving the dog a pill.”

TWO YEARS AGO, on the Fourth of July, a dog named Dixie was sitting in the backyard of her owners, Pat and Jen Morphy of Martinez, Calif. Around dusk, the sky above her exploded with the flashes and percussive booms of

fireworks. Perhaps kids detonated firecrackers on the street nearby as well. Whatever happened, Dixie hasn't been the same since.

Earlier this year the Morphys brought Dixie to see Rachel Malamed at the U.C. Davis Behavior Service. The Morphys reported that they take Dixie for a walk every day after work and then put her in the backyard. As soon as the sun sets, Dixie bolts for the house and cannot be dragged from it for the rest of the evening. She paces, stares and scans the air overhead. "You can just tell she's waiting for something to happen," Pat said. Dixie is eager for bedtime and scootches under the couple's bed to sleep. But in the middle of the night, Dixie often jumps up on the bed and walks on Jen's head. When she turns the lights on, the dog looks terrible, shivering and blank-eyed. It takes anywhere from 15 minutes to four hours to calm her enough to go back to sleep. "I can't live with this dog any more how she is," Jen said.

Malamed put a sound-effects CD into a boom box and set the volume to low. Dixie sat serenely through a trumpet fanfare, a toilet flush, a metal saw, ringing bells and raspy hinges. But at the sound of fireworks, during the long whistle and well before the climactic pop, Dixie tensed up; she tried to climb into Jen's lap and began trembling. Malamed hit stop. "I'm sorry I had to do that," she said. Noise [phobias](#), especially those related to thunderstorms, are fairly common in dogs, and Malamed determined that Dixie had a [phobia](#) to fireworks.

So how did Dixie's curious phobia develop? A Skinnerian would explain her problems within the bounds of stimulus-response conditioning, unthinking and automatic. On that first Fourth of July, Dixie correctly learned that fireworks are painfully loud but mistakenly linked the traumatic event with nightfall. Now every dark sky scares her. Her odd after-hours activity was very

likely strengthened by more conditioned learning: every time she jumps on the bed in the middle of the night, Pat or Jen give her attention. Believing that they are soothing Dixie, they are actually rewarding and enforcing her troubled behavior.

But is her problem more complex than that? Most scientists now accept that animals experience basic emotions like pleasure, excitement and fear. These primal feelings provide useful motivation: to mate, kill prey or avoid danger. But whether emotional states like anxiety, obsession and depression exist is more controversial. The difference between fear and anxiety, after all, is the difference between a gazelle spooking at the sight of a lion and a gazelle worrying that a lion might appear. If you believe that the latter is possible, consider that Dixie might have some memory, however dim, of the original fireworks and that when she sees the sun setting, she becomes tense at the thought that they might percuss her eardrums again. In other words, her cognition goes beyond in-the-moment processing of sensory information; to paraphrase Eric Sidel, a professor of philosophy at [George Washington University](#), she is not responding to the world but instead to the way she pictures the world. She thinks and, critically, is aware of her own thoughts.

By most any definition, this amounts to consciousness, the trait that people have traditionally been most loath to credit to animals. Many thinkers are hesitant to make definitive statements about any aspect of an animal's internal life, much less to conclude that they are self-aware. In an influential essay published in 1974, the philosopher Thomas Nagel posed the question "What is it like to be a bat?" What is it like, really, to wheel blindly through the night sky hunting insects and navigating by echolocation? The sum of a being's unique sensory and cognitive worlds constitute its *Umwelt*, and Nagel concluded that it was impossible to know any *Umwelt* but that of our own

species. The words we use to describe animal mental states are hazy approximations at best. Hank Davis, an evolutionary psychologist at the University of Guelph in Canada who has studied cognition in rats, rabbits and the aforementioned hissing cockroaches, told me that “I am as big an animal lover as anybody I’ve ever met. I can go on and on about how sweet and smart and emotional my pet rat is. But we have to be careful about saying that when my rat appears anxious or obsessive that she is experiencing the identical set of neurological conditions that a human would.” Prescribing drugs under those circumstances, he says, is “questionable ‘Twilight Zone’-type medicine.”

The skeptics are correct that there’s no [smoking](#) gun proving that human feelings and Dixie’s are similar, but on the flip side, there is a preponderance of circumstantial evidence. The limbic system, critical for human emotional responses, is structurally similar in all mammals. “People have a physiological response to the thing they fear,” says Steven Hamilton, a psychiatric geneticist at the University of California, San Francisco. “They get tremulous. Their [heart rate](#) goes up. They perspire. Their respiration will go up. Dogs do the exact same thing.” The clinical presentation of the problem is similar, too.

Confronted by what they fear, phobic people and dogs try to get as far away as they can from the dreaded stimulus, be it spiders or fireworks. In both populations, susceptibility appears to be [heritable](#). And finally, “humans respond to particular anxiolytic and antidepressant medications, and we find similar responses in dogs to the same drugs,” Hamilton says.

Dodman made the same points to me and concluded, somewhat exasperatedly, “If it looks, waddles and quacks like a duck, then maybe it is a duck.” He bristled at the charge that behavioral pharmacologists practice “Twilight Zone” medicine. The primary source of outrage for most critics is the thought of veterinary kooks dosing helpless animals with human drugs. But

that misstates the matter. Long before Prozac, [Paxil](#) and the like were taken by people, they were tested for safety and efficacy in legions of laboratory creatures. You can plausibly argue — and Dodman and others do — that humans are in fact using animal drugs.

At the U.C. Davis clinic, Malamed told the Morphys that “we need to change Dixie’s emotional response to the noise.” She prescribed Clomicalm, to ease Dixie’s anxiety and make her more receptive to training, and Xanax, which in the short term would dull her panic attacks and help her sleep. She recommended that they play the recorded sound of fireworks very quietly while rewarding the animal for being calm. A few weeks later, Jen reported that Dixie was sleeping through the night.

THREE WEEKS AFTER MAX started Clomicalm, Allan and I took him for a walk along a creek. He sniffed the grass on the banks; he barked at a passing dog. We got back to the house, and as we took turns tossing the Frisbee to Max on a lawn out front, I asked how things were going with the tail chasing. “He still does it,” Allan said. “But it’s not as bad as it was.” According to the vet, the drug needed another couple of weeks before it would be fully effective on Max’s neurochemistry, so Allan was withholding judgment until then. A couple of months later, Allan told me that he thought Max was only spinning half as much as he had.

Dodman says that the serotonin-affecting drugs like Clomicalm have the effect of “oil on troubled waters” — they may calm the animal but don’t attack the underlying problem. To learn more about why dogs chase their tails, and in hopes of developing more precise drug treatments, Dodman and other researchers at other universities are hunting for the genetic underpinnings of the disorder.

Dogs are a geneticist's dream. Lab rats can be artificially induced to suffer certain problems — for example, electrically shocked to create a fearful state — whereas dogs are natural models, exhibiting anxiety, phobias and compulsions on their own. The canine genome, whose sequencing was recently completed, is considerably easier to analyze than the human one. The canine gene pool has been highly restricted and segregated during the creation of distinct dog breeds, much of which happened within the past 200 years. Members within a breed are highly similar genetically, making mutations that might cause behavior problems easier to spot. Purebred dogs are also excellent for testing theories about heritability. “There are fantastic genealogical resources that can connect dogs within a century for dozens of generations,” Hamilton says.

In certain breeds, almost all of the dogs alive today are descendants of a handful of popular sires that exemplified traits that breeders liked — for instance, a snowy white coat or exceptional herding ability. In selecting for these desired traits, however, the breeders sometimes inadvertently selected for the sires' undesirable genetic mutations. This appears to be the case with canine compulsive disorder. A half-dozen or so breeds are predisposed to get it and in fact are susceptible to particular forms of the disorder — for example, German shepherds tend to tail-chase, while Doberman pinschers suck their flanks. Dodman and his colleagues are running genetic analyses of 146 Dobermans, more than half of them afflicted and the others not. His hunch is that a genetic glitch that leads to overactive glutamate receptors may increase susceptibility for developing compulsive behaviors. The same may be true for people. If this is correct, then it would ratify an approach that Dodman and a colleague have patented for treating both animal and human compulsive disorders with drugs that inhibit the glutamate receptors. Similar hunts are under way for the genetic underpinnings of what looks like [psychotic](#) rage in cocker spaniels and phobias in Australian shepherds, and those searches, too,

may yield drug treatments for the canine and human versions of those problems.

Though certain dogs are probably genetically predisposed, environmental factors are clearly involved as well. “All of the animals I see that have [O.C.D.](#) are anxious individuals who’ve been in a rock-and-a-hard-place conflict situation in their lives which precipitates their condition,” Dodman says. Stressful situations in which an animal is repeatedly prevented from doing what it wants to do lead to anxiety, and anxiety can be relieved by indulging in a repeated behavior that long outlasts the original situation. That, it turned out, was exactly the case with Max. Though he lived a perfect dog’s life in California — plenty of love, company and exercise — Allan said that for most of the first year of his life, when he belonged to another owner, he was confined inside and all alone.

At end of the day that I visited Dodman, we sat watching video clips of dogs repetitively pacing, chasing shadows and snapping at nonexistent flies. Dodman, leaning back in his chair, launched into a story about a human obsessive-compulsive-disorder sufferer he had met — a man who repeatedly tugged at his beard. Dodman asked him if he had ever stopped, and the man said he did during a hitchhiking trip across Canada. Dodman thought he knew why: “He went back to being a human being. He was watching out for real dangers. He was trying to go to real places. He was concerned about his next meal. He was thinking about where he was going to sleep. And he wasn’t concerned about the stupid beard pulling, because now he had a real life. When did the problem start again? The minute he sat back in front of a flickering computer screen.”

Dodman's theory, essentially, is that the causes of mood disorders and obsessions in humans and our pets aren't so different — faulty genetics, dreary environments. Whether cubicle- or cage-bound, we get too little exercise; we don't hunt, run or play enough to produce naturally mood-elevating neurochemicals. Strangely enough, I had already heard this theory — from a pharmaceutical company executive who, for obvious business reasons, didn't want to be named. "All of the behavioral issues that we have created in ourselves, we are now creating in our pets because they live in the same unhealthy environments that we do," he said. "That's why there is a market for these drugs."

James Vlahos writes for National Geographic Adventure, Popular Science and Popular Mechanics. This is his first article for the magazine.

This article has been revised to reflect the following correction:

Correction: July 12, 2008

The cover article this weekend about the expanding market for mood-altering drugs for cats and dogs misstates the revenues Pfizer Animal Health has earned from animal medications. The total for this division, which includes livestock, is \$2.6 billion, not "nearly \$1 billion." Its "companion animals," or pet division, contributed nearly \$1 billion to this total.

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